

We claim:

1. A catalyst which comprises a titanium zeolite, a transition metal, and a polymer, wherein at least one of the titanium zeolite or transition metal is encapsulated within the polymer.
2. The catalyst of claim 1 wherein the titanium zeolite is TS-1.
3. The catalyst of claim 1 wherein the transition metal is selected from the group consisting of Pd, Pt, Ru, Rh, Re, Au, and mixtures thereof.
4. The catalyst of claim 1 wherein the transition metal is Pd.
5. The catalyst of claim 1 wherein the polymer is selected from the group consisting of polystyrenics, polyolefins, polyureas, polyacrylics, polyurethanes, polyesters, polyamides, fluorinated polymers, polysaccharides, polypeptides, polynucleotides, and mixtures thereof.
6. The catalyst of claim 5 wherein the polymer is polystyrene.
7. The catalyst of claim 1 wherein the polymer is a phosphorus-functionalized polystyrenic.
8. The catalyst of claim 1 comprising a polymer-encapsulated Pd/TS-1.
9. The catalyst of claim 1 comprising an admixture of TS-1 and polymer-encapsulated Pd.
10. The catalyst of claim 1 comprising an admixture of polymer-encapsulated TS-1 and supported Pd or a supported Pd complex.
11. A process which comprises oxidizing an organic compound in the presence of hydrogen, oxygen, and the catalyst of claim 1.
12. The process of claim 11 wherein the organic compound is propylene and the oxidation product is propylene oxide.
13. The process of claim 11 wherein the transition metal is Pd and the titanium zeolite is TS-1.
14. The process of claim 11 wherein the polymer is selected from the group consisting of polystyrenics, polyolefins, polyureas, polyacrylics, polyurethanes, polyesters, polyamides, fluorinated polymers, polysaccharides, polypeptides, polynucleotides, and mixtures thereof.

15. The process of claim **11** wherein the catalyst comprises a polymer-encapsulated Pd/TS-1.

16. The process of claim **11** wherein the catalyst comprises an admixture of TS-1 and polymer-encapsulated Pd.

17. The process of claim **11** wherein the catalyst comprises an admixture of polymer-encapsulated TS-1 and supported Pd or a supported Pd complex.

18. The process of claim **11** performed in the presence of a solvent selected from the group consisting of water, alcohols, carbon dioxide, and mixtures thereof.

19. The process of claim **11** wherein the organic compound is an arene and the oxidation product is a phenol.

20. The process of claim **11** wherein the organic compound is a phenol and the oxidation product is a catechol.

21. The process of claim **11** wherein the organic compound is a ketone and the oxidation product is an ester or a lactone.

22. The process of claim **11** wherein the organic compound is an aldehyde or a ketone, the process is performed in the presence of ammonia or an amine, and the oxidation product is an oxime.

23. The process of claim **11** wherein the organic compound is an alkane and the oxidation product is an alcohol, a ketone, or a mixture thereof.

24. The process of claim **11** wherein the organic compound is a thioether and the oxidation product is a sulfone, a sulfoxide, or a mixture thereof.